

SLS PDR

PRELIMINARY DESIGN REVIEW

ENGINES

WHERE WE ARE

- On track to deliver repurposed RS-25 engines with new controller to meet Core Stage integration milestones in 2016.
- Nearing completion of J-2X development testing, which benefits RS-25 through controller development and main combustion chamber hot-fire experience.
- Aggressively pursuing use of Selective Laser Melting (SLM) to manufacture parts for affordability; part accepted and tested on J-2X.
- Completed RS-25 Preliminary Program Support Checkpoint (a PDR-level milestone).
- Completed RS-25 Engine Controller Critical Design Review (CDR).

MAJOR ACCOMPLISHMENTS

RS-25 Adaptation to SLS



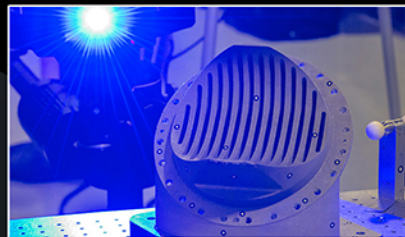
- Established plan for heritage hardware life to meet first 4 SLS flights.
- Commenced Stennis Space Center A-1 Test Stand readiness for future RS-25 testing.
- Preparing for high LOX inlet pressure and start sequence testing in 2015.

Common Engine Controller



- Conducted Demo 1 in September 2012; demonstrated J-2X derivative controller can control RS-25 engine valves.
- Proceeded to manufacturing based on CDR completed on May 1, 2013. Hardware CDR, Controller drawings, and models and analysis are complete, and EEE parts are on order.
- Interfaced with the Ground Operations Liaison Office for transfer of assets at Kennedy Space Center.
- Preparing for dual-redundancy prototype RS-25 controller Demo 2 in December 2013.

Advances for Affordability



- Conducted Value Stream Mapping events to optimize manufacturing processes.
- Increased buying power through use of common suppliers.
- Initiated use of SLM to significantly reduce hardware cost and production time, while increasing quality—e.g., complex parts can be made as one homogenous structure with no welds.
- Conducting structured light testing, which greatly reduces traditional inspection time while gaining a greater amount of data.